SAMPLE MATERIAL

Grades 7-8 Mathematics Course Descriptions

Longfellow Middle School, Virginia

Topic: National Math Panel: Critical Foundations for Algebra
Practice: Mastery Framework

This handout shows how one middle school organizes mathematics course offerings for grade 7 and 8 students. The descriptions include the topics covered, as well as the benchmarks that students are expected to master. The handout also describes the programs offered for struggling students and gifted and talented students.

Longfellow mathematics teachers differentiate instructional objectives for students emphasizing the enrichment of the curriculum through the extension, application, and analysis of content and development of problem solving strategies.

Middle School Mathematics 7

Students examine algebra and geometry preparatory concepts and skills; strategies for collecting, analyzing, and interpreting data; and number concepts and skills especially proportional reasoning. Reasoning, problem solving, communication, concept representation, and connections among mathematical ideas are emphasized in a hands-on learning environment. Graphing calculators and computers are integrated with instruction.

Honors Math 7

Prerequisite: Testing required and Recommendation of 6th grade teacher. A fast paced non-traditional approach to advanced mathematics. The emphasis of the course is on problem solving, theory, and abstract reasoning. Both testing and a teacher recommendation are required for enrollment into this course. Note that no textbook is used and an in-depth syllabus can be supplied upon request.

Algebra I, Honors

Grades: 7 & 8. Prerequisite: Mathematics 7 and/or Mathematics 8

Students extend knowledge and understanding of the real number system and its properties through the study of variables , expressions, equations, inequalities, and the analysis of data from real world phenomena. Emphasis is placed on algebraic connections to arithmetic, geometry, and statistics. Calculators and computer technologies are integral tools. Graphing calculators are an essential tool for ever student to explore graphical, numerical, and symbolic relationships. This course has an end-of-course Standards of Learning test.

Students who have mastered the standards of Mathematics 7 and 8 in grade 7 are eligible to take algebra in grade 8. When taken in grade 8, algebra becomes part of the high school transcript record, is included in the determination of the high school grade point average (GPA), and counts as one of the required mathematics credits for high school graduation. Parents may request that the algebra grade be omitted from the student's transcript and the student not earn high school credit for the course. Students taking algebra in grade 8 must pass the course to be promoted to grade 9.

Note: Admission to the Thomas Jefferson High School for Science and Technology requires the completion of Algebra prior to grade nine.

Note: Longfellow Middle School works in partnership with sixth grade teachers to make an accurate assessment of the proper course selection for each individual student.

Promotion Benchmarks
Grade 7 Mathematics

	FCPS Promotion Benchmark	SOL	POS
Number and Number Sense			
1.	Represents rational numbers as fractions, decimals, and percents.	7.1	7.1.1
2.	Graphs rational numbers on a number line.	7.1	7.1.1
3.	Uses order of operations to simplify numerical expressions that include integers and positive exponents.	7.2	7.1.3
Computation and Estimation			
4.	Solves practical problems involving operations with positive rational numbers.	7.4	7.2.1
5.	Solves problems involving sales tax, discount, tip, and simple interest.	7.4	7.1.5
6.	Performs operations with integers by using concrete materials, pictorial representations, or paper and pencil.	7.5	7.1.37.1.5
7.	Uses proportions to solve practical problems.	7.6	7.1.5
Measurement			
8.	Solves problems involving the perimeter of two-dimensional figures.	7.7	7.4.1
9.	Solves problems involving the area of two-dimensional figures.	7.7	7.4.1
10.	Solves problems involving the volume of rectangular prisms and cylinders.	7.8	7.4.1
11.	Solves problems involving the surface area of rectangular prisms and cylinders.	7.8	7.4.1
Geometry			
12.	Compares and contrasts quadrilaterals.	7.9	7.3.4
13.	Writes proportions to express the relationships between corresponding parts of similar triangles or similar quadrilaterals.	7.11	7.3.3
14.	Graphs ordered pairs in a coordinate plane.	7.12	7.2.3
15.	Graphs the translation of a polygon on a coordinate plane.	7.13	7.3.1
Probability and Statistics			
16.	Identifies the number of possible arrangements of several objects by using the fundamental counting principle or a tree diagram.	7.15	7.5.5
17.	Solves problems involving measures of central tendency.	7.16	7.5.2
18.	Displays data using frequency distributions and histograms.	7.17	7.5.1
19.	Displays data using box-and-whisker plots, stem-and-leaf plots, and scatter plots.	7.17	7.5.1
Patterns, Functions, and Algebra			
20.	Analyzes arithmetic and geometric sequences to find the next term.	7.19	7.5.2

Middle School Mathematics 8

Students examine algebra- and geometry-preparatory concepts and skills; strategies for collecting, analyzing, and interpreting data; and number concepts and skills, especially proportional reasoning. Reasoning, problem solving, communication, concept representation, and connections among mathematical ideas are emphasized in a hands-on learning environment. Graphing calculators and computers are integrated with instruction.

***Algebra I, Honors (one credit)**

Prerequisite: Middle School Mathematics and recommendation of instructor. NOTE: Admission to the Thomas Jefferson High School for Science and Technology requires the completion of Algebra I prior to grade 9. Students intending to pursue the International Baccalaureate Diploma (IB) at Marshall High School, Algebra I, Honors is recommended preparation in Grade 8.

Students extend knowledge and understanding of the real number system and its properties through the study of variables , expressions, equations, inequalities, and the analysis of data from real world phenomena. Emphasis is placed on algebraic connections to arithmetic, geometry, and statistics. Calculators and computer technologies are integral tools. Graphing calculators are an essential tool for ever student to explore graphical, numerical, and symbolic relationships. This course has an end-of-course Standards of Learning test.

Students who have mastered the standards of Mathematics 7 and 8 in grade 7 are eligible to take algebra in grade 8. When taken in grade 8, algebra becomes part of the high school transcript record, is included in the determination of the high school grade point average (GPA), and counts as one of the required mathematics credits for high school graduation. Parents may request that the algebra grade be omitted from the student's transcript and the student not earn high school credit for the course. Students taking algebra in grade 8 must pass the course to be promoted to grade 9.

Geometry, Honors (one credit)

Prerequisite: Algebra I.

Students investigate properties of triangles, quadrilaterals, polygons, circles, and solids using inductive and deductive reasoning. Conjectures about properties and relationships are developed inductively and then verified deductively. Vectors, transformation, algebra, and technologies are used as tools to solve geometry problems. Study includes an introduction to non-Euclidean surfaces. This course has an end-of-course Standards of Learning test.

Promotion Benchmarks
Grade 8 Mathematics

	FCPS Promotion Benchmark	SOL	POS
Number and Number Sense			
1.	Simplifies numerical expressions that contain rational numbers and positive exponents by using properties of real numbers and the order of operations.	8.1	8.1.1
2.	Converts numbers written in standard notation to scientific notation and vice versa.	8.1	8.1.1 7.1.2
Computation and Estimation			
3.	Solves practical problems that involve real-life data from fields such as science, sports, and transportation.	8.3	8.2.1
4.	Checks the solution to an equation by substitution and simplification.	8.4	8.2.1
5.	Checks the solution to an inequality by substitution and simplification.	8.4	8.2.1
Measurement			
6.	Solves problems involving vertical angles, complementary angles, and supplementary angles.	8.6	8.3.2
7.	Solves problems involving the volume of cones and pyramids.	8.7	8.4.1
8.	Solves problems involving the surface area of cones and pyramids.	8.7	8.4.1
Geometry			
9.	Graphs the reflection or dilation of a quadrilateral on the coordinate plane.	8.8	8.3.1
10.	Constructs a three-dimensional model given the top, side, and/or bottom views.	8.9	7.4.1
11.	Uses the Pythagorean Theorem to determine the measure of any side of a right triangle.	8.10	8.4.1
Probability and Statistics			
12.	Solves probability problems involving independent events.	8.11	8.5.3
13.	Uses box-and-whisker plots to find the median, range, and quartiles of a data set.	8.12	8.5.2
14.	Uses scatter plots to make predictions.	8.12	8.5.2
Patterns, Functions, and Algebra			
15.	Represents relations using tables and graphs.	8.14	8.2.2
16.	Represents relations using algebraic sentences and word statements.	8.14	8.2.2
17.	Solves equations using algebraic sentences, concrete materials, or pictorial representations.	8.15	8.2.1
18.	Solves inequalities using algebraic sentences, concrete materials, or pictorial representations and represents the solution graphically.	8.15	8.2.1
19.	Graphs linear equations in two variables on the coordinate plane.	8.16	8.2.2
20.	Solves practical problems by using formulas.	8.17	8.2.1

Special Programs:

Gifted & Talented Center Services:

Longfellow offers gifted and talented center (GTC) services. Our full time center program offers eligible students a challenging academic program designed to meet the needs of highly gifted students. Curriculum differentiation in the depth, breadth, and pace of instruction is matched to students' needs in each content area. While these students work with academic peers in core subject areas, they interact with the entire student body in clubs and intramurals, physical education, and electives. Many GTC students participate in enrichment activities at Longfellow. Because a large number of our GTC students are accepted into Thomas Jefferson High School for Science and Technology (TJHSST) each year, the Longfellow staff works closely with the TJHSST staff regarding orientation, admission procedures, and vertical articulation.

Special Education Services:

Special Education Resource Services:

Special education services at the resource level provide additional support and basic skills training for students who are in the regular education program and need individualized instruction and accommodations in areas that are defined by an Individual Education Plan (IEP).

Additional Course Offerings:

Power Mathematics:

Grade 7. Power Mathematics is a one-semester course designed to provide students with foundational concepts and skills to support success with current mathematics explorations and enhance experiences with future mathematics study. The course focuses on fundamental skills, including integer operations, order of operations, equivalence, percent and percent applications, along with area and graphing concepts. This course replaces one elective. Conditionally promoted students *must* take this course. If additional students can be accommodated, they are selected based on fifth grade SOL scores in mathematics and/or the recommendation of 6 th grade teachers.

Power Mathematics and Science:

Grade 8. Power Mathematics and Science is a one-semester course that focuses on fundamental skills with ratios and proportions, measurement in two and three dimensions and statistics, along with a heavy emphasis on algebraic thinking and equations. Additionally, the class includes direct instruction in science concepts including scientific investigation, living systems, ecosystems, heredity and diversity. This course replaces one elective. Conditionally promoted students *must* take this course. If additional students can be accommodated, they are selected based on teacher recommendation and/or fifth grade SOL scores in mathematics and science.

Algebra Readiness:

Grade 8. Algebra Readiness is a one-semester course designed to assist students in mastering the Virginia Standards of Learning for mathematics for grades six through eight and to help assure readiness for Algebra 1. The program provides specific intervention through instruction in number and number sense; computation and estimation; measurement; geometry; probability and statistics; and patterns, functions, and algebra. This course replaces one elective. Students are selected based on teacher recommendation, fifth grade SOL score in mathematics, and/or achievement on an on-line state assessment.